

**AMENDMENTS TO THE DRAWINGS**

**Figures 1-3 have been amended to provide a label for each of the boxes in the figures.**

Enclosures: Two (2) Replacement Sheets

### REMARKS

Claims 1 and 3-27 are all the claims pending in the application. By this Amendment, Applicant amends claims 1, 6, 10, 11, 15, and 20 to cure minor informalities and to further clarify the invention. In order to provide more varied protection, Applicant adds claim 22-27, which are clearly supported throughout the specification *e.g.*, page 7 of the specification.

#### I. Preliminary Matter

As a preliminary matter, the Examiner objected to Figs. 1-3 because there are no descriptive legends for the boxes in these figures. Applicant respectfully requests the Examiner to withdraw these objections to the figures in view of the self-explanatory amendments to the figures being made herein. No new matter is being added.

#### II. Summary of the Office Action

The Examiner maintained the previous grounds of rejection and issued a new rejection. Claim 10 is rejected under 35 U.S.C. § 112, first paragraph and claim 1 is rejected under 35 U.S.C. § 112, second paragraph. In addition, claims 11 and 21 are rejected under 35 U.S.C. § 102(b) and claims 1-10 and 12-20 are rejected under 35 U.S.C. § 103(a).

#### III. Claim Rejection under 35 U.S.C. § 112, first paragraph

Claim 10 is rejected under 35 U.S.C. § 112, first paragraph. Applicant respectfully traverses these grounds of rejection at least in view of the following exemplary comments. The Examiner states that it is unclear how instructions can split a signal (*see* pages 2-3 and 8 of the Office Action). Applicant respectfully submits that for a splitting unit to split the optical signal, there may be some stored instructions that instruct the splitting unit to split the signal. Accordingly, contrary to the Examiner's allegations, it is not impossible to have instructions

instructing the splitting unit to split the signal. Claim 10 is clearly enable and supported by the specification. Accordingly, Applicant respectfully requests the Examiner to withdraw these grounds of rejection.

IV. Claim Rejection under 35 U.S.C. § 112, second paragraph

Claim 1 is rejected under 35 U.S.C. § 112, second paragraph. Applicant respectfully thanks the Examiner for pointing out, with particularity, the aspects of the claim thought to be indefinite. Applicant respectfully requests the Examiner to withdraw this rejection in view of the self-explanatory claim amendments being made herein.

V. Claim Rejection under 35 U.S.C. § 102

Claims 11 and 21 are rejected under 35 U.S.C. § 102(b) as being anticipated by EP Patent Application No. EP 0,996,243 A1 to Bergh et al. (hereinafter “Bergh”). Applicant respectfully traverses these grounds of rejection at least in view of the following exemplary comments.

To be an “anticipation” rejection under 35 U.S.C. § 102, the reference must teach every element and recitation of the Applicant’s claims. Rejections under 35 U.S.C. § 102 are proper only when the claimed subject matter is identically disclosed or described in the prior art. Thus, the reference must clearly and unequivocally disclose every element and recitation of the claimed invention. MPEP § 2131.

Of these rejected claims, only claim 11 is independent. Independent claim 11 recites: “the DSP processing unit analyzes the first split part for intensity information of the whole optical signal, and ...the DSP processing unit analyzes the second split part for information specific to only the second split part of the optical signal.”

In response to Applicant's arguments, the Examiner alleges that Bergh's DSP 12 analyzes part of the signal directly from the splitter 6 for intensity information of the whole optical signal (*see* pages 8-9 of the Office Action). The Examiner, however, failed to indicate where the support for these alleged teachings are provided in the reference (*see* pages 4 and 8-19 of the Office Action). Applicant has carefully restudied Bergh's disclosure of the DSP 12 and Applicant respectfully submits that Bergh does not disclose or even remotely suggest using only the portion of the signal provided directly from the splitter 6 to diode 8 for detecting intensity.

Bergh discloses that once the signals (i.e., both signals) are provided to the DSP 12, the DSP 12 calculates the probability density of the discrete power levels of the data channels resulting in a probability density function (Fig. 2; page 4, lines 11-13). The Gaussian channel parameters are extracted from the probability density function (page 4, lines 13-15). These Gaussian channel parameters are then used to produce monitor information for the optical network (page 4, lines 15-16).

Because Bergh discloses only using a DSP to determine Gaussian channel parameters for data channels in an optical network from both signals, Bergh does not disclose a DSP that analyzes the first split part for intensity information of the whole optical signal and the second split part for information specific to only the second split part of the optical signal. That is, Bergh does not disclose analyzing split signals separately for different measurements using the DSP. Instead Bergh discloses analyzing an entire signal to determine the Gaussian channel parameters for use in monitoring the optical network.

Since Bergh only discloses a DSP calculating the Gaussian channel parameters from both portions of the signal, the rejection is improper as it lacks "sufficient specificity" required under 102. "[A]nticipation under § 102 can be found only when the reference discloses exactly what is

claimed and that where there are differences between the reference disclosure and the claim, the rejection must be based on § 103 which takes differences into account.” *Titanium Metals Corp. v. Banner*, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985); MPEP § 2131. Bergh does not disclose or even remotely suggest using first split portion of the signal for determining intensity of the whole signal and using second split portion of the signal for calculating information specific to the second split portion of the signal.

Therefore, “the DSP processing unit analyzes the first split part for intensity information of the whole optical signal, and ...the DSP processing unit analyzes the second split part for information specific to only the second split part of the optical signal,” as set forth in claim 11 is not disclosed by Bergh, which lack having the DSP use different portions of the split signal to obtain different information. For at least these exemplary reasons, claim 11 is patentably distinguishable from Bergh. Accordingly, Applicant respectfully requests the Examiner to withdraw this rejection of claim 11 and its dependent claim 21.

In addition, dependent claim 21 recites: “wherein the optical filtering elements(s) comprise at least one of chromatic dispersion elements, polarization filers, and spectral filers.” The Examiner simply alleges that Bergh’s disclosure of attenuator 7 somehow meets the unique features of this claim. Applicant respectfully submits that Bergh only discloses an attenuator 7 (*i.e.* that weakens the strength of the signal) and as such does not disclose or suggest that the attenuator 7 is a chromatic dispersion elements, a polarization filer, or a spectral filer. For at least these additional exemplary reasons, Claim 21 is patentably distinguishable from Bergh.

VI. Claim Rejections under 35 U.S.C. § 103

*Claims 1, 3, and 12-14 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,707,963 to Kawarai (hereinafter “Kawarai”), in view of U.S. Patent No.*

**7,068,949 B2 to Jung et al. (hereinafter “Jung”) and U.S. Patent No. 7,158,723 B2 to Wan et al. (hereinafter “Wan”).** Applicant respectfully traverses these grounds of rejection at least in view of the following exemplary comments.

Of these rejected claims, only claim 1 is independent. Claim 1 recites *inter alia*: “a splitting unit splitting the optical signal received by the receiver input into a number of parts such that said number corresponds to a number of diodes in the receiver;... wherein the split parts of the optical signal are fed into said at least two waveguide branches such that the entire optical signal is fed into the at least two waveguide branches, wherein each waveguide branch comprises a different optical filtering element...”

That is, in an exemplary, non-limiting embodiment, it is disclosed that a signal is split into a number of parts and each of these parts are fed into one of the branches (*e.g.*, see Figs. 1-3). In other words, in an exemplary embodiment of the present invention, the signal is split into the number of branches available and each branch has a filtering element such that each split portion is processed with a different filter. It will be appreciated that the foregoing remarks relate to the invention in a general sense, the remarks are not necessarily limitative of any claims and are intended only to help the Examiner better understand the distinguishing aspects of the claims mentioned further below.

In response to Applicant’s arguments, the Examiner alleges Fig. 6 of Kawai discloses splitting the signal into a number of branches and having different filters for each split portion *i.e.*, filters A and B (*see* page 9 of the Office Action). Applicant respectfully submits that Kawai discloses separating only part of the input light for the optical filters as a portion of the signal is transmitted out of the transponders 20 and into the variable attenuation section 10 (Fig.

1). Accordingly, Kawai fails to disclose or even remotely suggest that the splitting unit splits the optical parts into a number of parts equal to the number of diodes.

Kawai discloses that a transponder 20 that has a wavelength locker 26 and that provides the signal to the attenuation section 10 (Figs. 1 and 2; col. 3, lines 20 to 59). Kawai further discloses that the wavelength locker 26 monitors the wavelength of the optical signal (Fig. 6; col. 3, lines 55 to 57). When one of the optical signals is supplied to the TP 20, part of the input light is separated and transmitted to optical filters 36 and 38 and subsequently detected by photodiodes 40 and 42. The photodiodes then provide detection results to the calculation unit 44 (Fig. 6; col. 4, lines 15 to 19). The results of the calculations are used to control the current fed into the Peltier element 28 whereas part of the input light remaining is fed into the variable attenuators (Fig. 2; col. 4, lines 20 to 37).

Clearly then, Kawai does not disclose or even remotely suggest that the signal is split into as many number of parts as there are filters. For example, Kawai discloses splitting the signal into three parts when there are two filters. Furthermore, Kawai does not disclose or even remotely suggest that each part is provided to a branch with a filter. For example, the light that passes through the wavelength locker is not provided to any branches with the filter.

Applicant has already demonstrated that Kawai does not meet all the requirements of independent claim 1. Jung is relied upon only for its teaching of using a DSP with an A/D converter. Clearly, Jung does not compensate for the above-identified deficiencies of Kawai. In addition, Wan is relied upon only for its teaching of using multiple A/D converters and as such also does not compensate for the above-identified deficiencies of the Kawai reference.

Therefore “a splitting unit splitting the optical signal received by the receiver input into a number of parts such that said number corresponds to a number of diodes in the receiver;...

wherein the split parts of the optical signal are fed into said at least two waveguide branches such that the entire optical signal is fed into the at least two waveguide branches, wherein each waveguide branch comprises a different optical filtering element,” as recited in claim 1 is not taught by the combined disclosures of Kawarai, Jung and Wan, which lack splitting the signal into number of parts equal to the number of filters such that entire signal is provided to one of the different filters on different branches.

Together, the combined teachings of these references would not have (and could not have) led the artisan of ordinary skill to have achieved the subject matter of claim 1. For at least the above exemplary reasons, claim 1 and its dependant claims 3 and 12-14 should be deemed allowable. Accordingly, Applicant respectfully requests that the Examiner to withdraw the 35 U.S.C. § 103(a) rejection of claims 1, 3, and 12-14.

*Claims 1, 3, 5-8, 10, 12-17, 19, and 20 are rejected under 35 U.S.C. § 103(a) as being unpatentable over A. Lima et al., “Polarization Diversity and Equalization for PMD Mitigation in Optical Communication Systems”, IEEE International Conference on Acoustics, Speech, and Signal Processing, May 13-17, 2002 (hereinafter “Lima”) in view of U.S. Publication No. 2002/0012152 A1 to Agazzi et al. (hereinafter “Agazzi”).* Applicant respectfully traverses these grounds of rejections at least in view of the following exemplary comments.

Of these rejected claims, claims 1, 6, 10, 15, and 20 are independent. This response at least initially focuses on exemplary features of claim 1. Claim 1 recites *inter alia*: “at least two waveguide branches, wherein the split parts of the optical signal are fed into said at least two waveguide branches, wherein each waveguide branch comprises a different optical filtering element, ... wherein different types of filtering process are executed in each waveguide branch.”



In response to Applicant's arguments, the Examiner alleges that the LPBS, L+45 PBS, and L + 45 PBS of Lima anticipate each branch having a different optical filter element, as set forth in claim 1 (*see* page 9 of the Office Action). That is, the Examiner alleges that beam splitters are filters. Applicant respectfully disagrees.

Lima discloses a method of improving performance gains by mitigating polarization mode dispersion (PMD) by using a receiver with polarization diversity (Lima; page 2721). Lima teaches that the polarization diversity receiver, depicted in Figure 1 of Lima, receives an incoming signal, which is equally split into three pairs of orthogonal polarizations (Lima; page 2722). The first and third pairs are provided to linear polarization beam splitters (LPBS), which split the signals by vertical and horizontal polarizations (Lima; page 2722). The second pair is applied to a quarter-wave plate, which is a filter that converts the signal from circular to linear polarization, and then applies that signal to the polarization beam splitter (PBS) (Lima; page 2722). From the LPBSs and PBS, the signals are applied to photodetectors, and then to corresponding combiner/equalizers, which combine the three pairs of signals (Lima; page 2722).

As is visible, Lima only discloses various beam splitters that split the signal into parts. Contrary to the Examiner's allegations, LPBS and PBS are splitters and not filters. Lima clearly discloses that a quarter-wave plate filters the signal and that the splitters split the signal (page 2722). As shown in Fig. 1 of Lima, only one branch has a quarter-wave plate filter and the remaining branches only have LPBS or PBS that split the signal further and provide each split part to its own diode. In short, Applicant respectfully submits that LPBS and PBS split (not filter) the signal. Agazzi is relied upon only for its alleged disclosure of using an ADC and a DSP. Clearly, Agazzi does not compensate for the above-identified deficiencies of Lima.

Therefore, “wherein different types of filtering process are executed in each waveguide branch,” as recited in claim 1 is not disclosed or suggested by the combined disclosures of Lima and Agazzi, which lack having different types of filtering operations being performed. For at least these exemplary reasons, claim 1 and its dependant claims 3, 5, and 12-14 should be deemed allowable.

To the extent that independent claims 6 and 10 recite similar elements, claims 6 and 10 and their dependent claims 7 and 8 should be deemed allowable.

Independent claim 15 *inter alia* recites: “wherein each waveguide branch is fed onto a separate single photo diode of the at least two diodes.” Lima however discloses that each branch is fed onto 2 diodes (Fig. 1). On the contrary, in Lima, on each branch the signal is split into two and fed into two diodes (Fig. 1). Agazzi is only cited for its disclosure of the DSP and as such clearly fails to cure the above-identified deficiencies of Lima. For at least these exemplary reasons, claim 15 is patentable over Lim in view of Agazzi. Accordingly, Applicant respectfully requests the Examiner to withdraw this rejection of claims 15 and its dependent claims 16, 17, and 19.

To the extent that independent claim 20 recites similar elements, claim 20 should be deemed allowable.

***Claims 4 and 18 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Lima and Agazzi in view of U.S. Patent No. 6,559,756 B2 to Al-Araji et al. (hereinafter “Al-Araji”).*** Applicant respectfully traverses these grounds of rejection at least in view of the following exemplary comments.

Claims 4 and 18 depend on claims 1 and 15. Applicant has already demonstrated that Lima and Agazzi do not meet all the requirements of independent claims 1 and 15. Al-Araji is

relied upon only for its disclosure of a DSP circuit that is implemented with a field programmable gate array (FPGA). Clearly, Al-Araji does not compensate for the above-identified deficiencies of Lima and Agazzi. Accordingly, claims 4 and 18 are patentable at least by virtue of their dependency on claims 1 and 15.

Applicant respectfully requests that the Examiner withdraw the 35 U.S.C. § 103(a) rejection for claims 4 and 18.

*Claim 9 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Lima and Agazzi in view of U.S. Patent Publication No. 2004/0017857 A1 to Chouly et al. (hereinafter "Chouly").* Applicant respectfully traverses these grounds for rejection at least in view of the following exemplary comments.

Claim 9 depends on claim 6. Applicant has already demonstrated that Lima and Agazzi do not meet all the requirements of independent claim 6. Chouly is relied upon only for its teaching of a MAP algorithm (see page 8 of Office Action dated May 10, 2007). Clearly, Chouly does not compensate for the above-identified deficiencies of Lima and Agazzi. Accordingly, claim 9 is patentable at least by virtue of their dependency on claim 6. Applicant respectfully requests that the Examiner withdraw the 35 U.S.C. § 103(a) rejection for claim 9.

#### VII. New Claims

In order to provide more varied protection, Applicant adds claims 22-27, which are patentable by virtue of their dependency and for additional features set forth therein.

#### VIII. Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. **If any points remain in issue, the**

**Examiner is kindly requested to contact the undersigned attorney at the telephone number listed below to set up an Interview.**

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

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**23373**

CUSTOMER NUMBER

Date: March 20, 2008